Statewide Pricing Pilot (SPP)

Overview and Design Features

SPP Conclusions

System Wide Impacts

Residential CPP rates can, within five years of deployment reduce California's peak load by 1,500 to over 3,000 mW.

Conservation and Peak Load Impacts

Dynamic rates encourage greater conservation and peak demand impacts than conventional inverted tier or time-of-use rates.

Customer Acceptance

Residential and small to medium commercial and industrial customers understand and overwhelmingly prefer dynamic rates to existing inverted tier rates.

Source: CEC staff conclusions based on review of collective SPP reports.

Pricing Pilot - Objectives

1. Estimate usage (kWh) and demand (kW) impacts from different time-differentiated rate forms.
2. Estimate price elasticities and develop econometric models to examine the effects of weather, customer usage and a other customer characteristics.
3. Estimate customer preference for dynamic and current rate forms.

Pricing Pilot
Significant Design Features

1. **Approximately 2,500 participating customers.**
2. **CPUC, CEC and CPA cooperative regulatory proceeding.**
3. **SCE, PG&E and SDG&E cooperative joint-venture pilot.**
   - **Revenue neutral rate designs.**
   - **CPP-V participants linked to existing thermostat pilots mandated under SB970.**

Pricing Pilot – Experimental Design

	Control	CPP-F	CPP-F Info Only	CPP-V SDGE	Info Only	TOU	Total Participants
Track A – Random Sampling with Opt Out Design							
Residential	470	542	0	125	126	200	1463
Commercial < 20kW	88	0	0	58	0	50	196
Commercial > 20kW < 200kW	88	0	0	80	0	50	218
Track B – San Francisco Cooperative							
Residential (PGE)	0	64	126	0	63	0	253
Track C – AB 970 Sub-Sample							
Residential	20	0	0	125	0	0	145
Commercial < 20kW	42	0	0	56	0	0	98
Commercial >20kW < 200kW	42	0	0	76	0	0	118
TOTAL PARTICIPANTS	**750**	**606**	**126**	**520**	**189**	**300**	**2,491**

Source: Statewide Pricing Pilot, Summer 2003 Impact Analysis, Charles Rivers Associates, August 9, 2004.

Pricing Pilot – Rate Forms

Inverted Tier

- Existing Rate
- Rate increases in stages based on monthly usage.

Time of Use (TOU)

- Experimental Rate – applicable statewide
- Seasonal, different rate for fixed on-peak and off-peak time periods.

Critical Peak Fixed (CPP-F)

- Experimental Rate – applicable statewide
- Time-of-use rate with an additional 'critical peak' price that can be dispatched during the peak-period for up to 15 times each year, with day ahead notice.

Critical Peak Variable (CPP-V)

- Experimental Rate – applicable target population only
- A Critical Peak Fixed rate with a critical peak price that can be dispatched during the peak-period for 2-5 hours, with 4 hour advance notice.

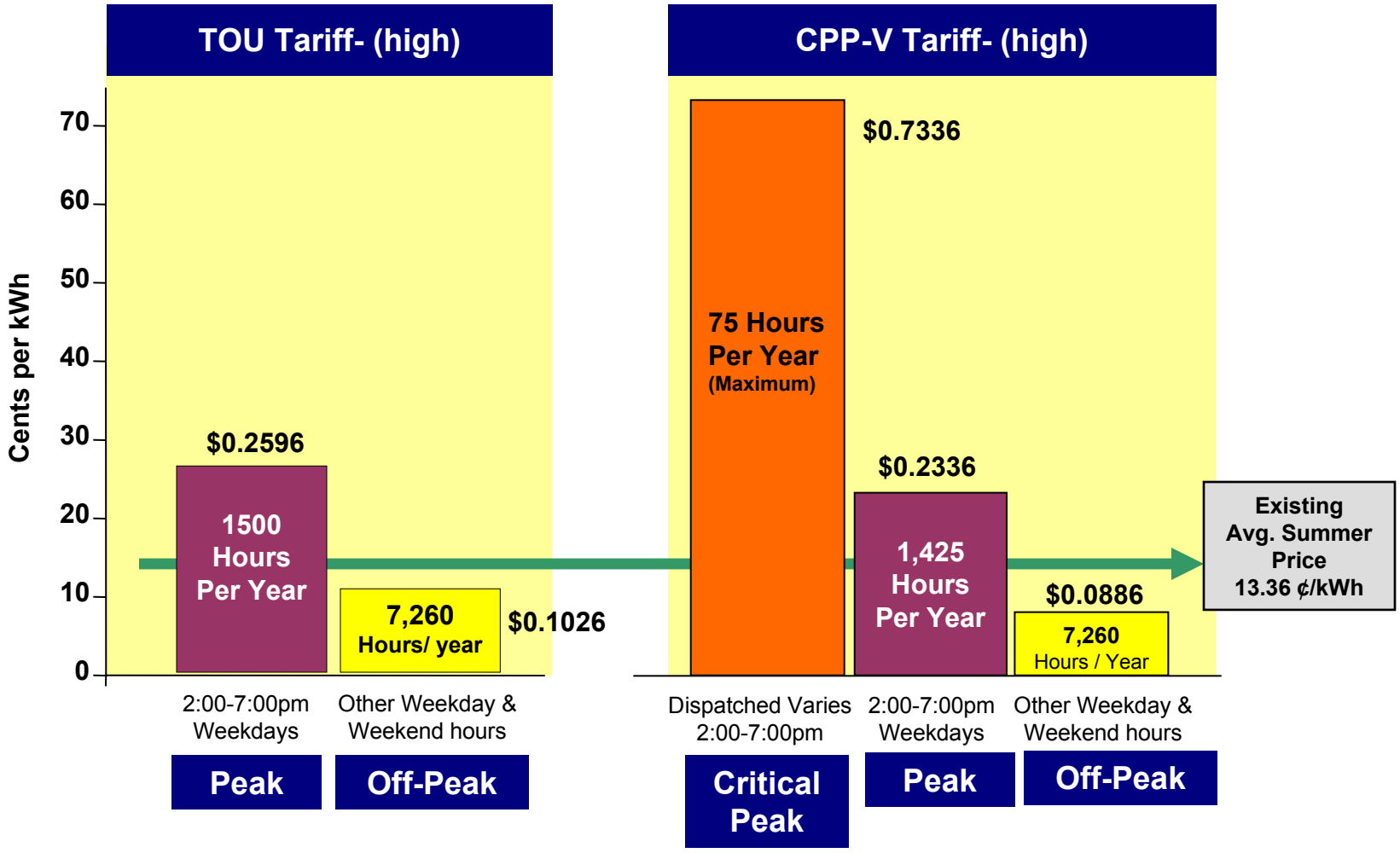
Note: TOU, CPP-F and CPP-V layered on top of existing Inverted Tier rates.

RATE DESIGN

SPP Residential Rate Forms

(Example TOU & CPP High Options)

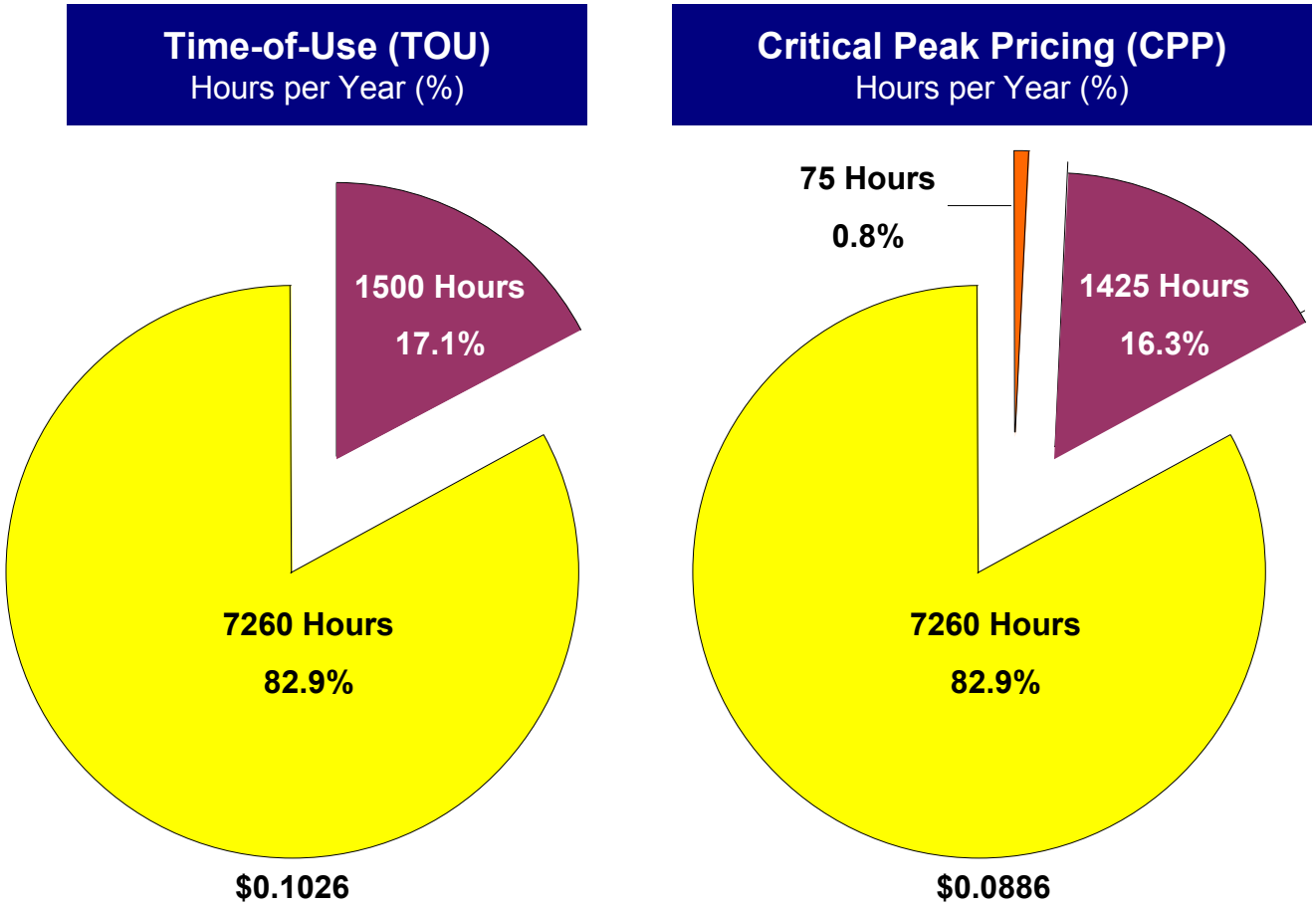
RESIDENTIAL



RATE DESIGN

RESIDENTIAL

SPP Residential Rate Forms

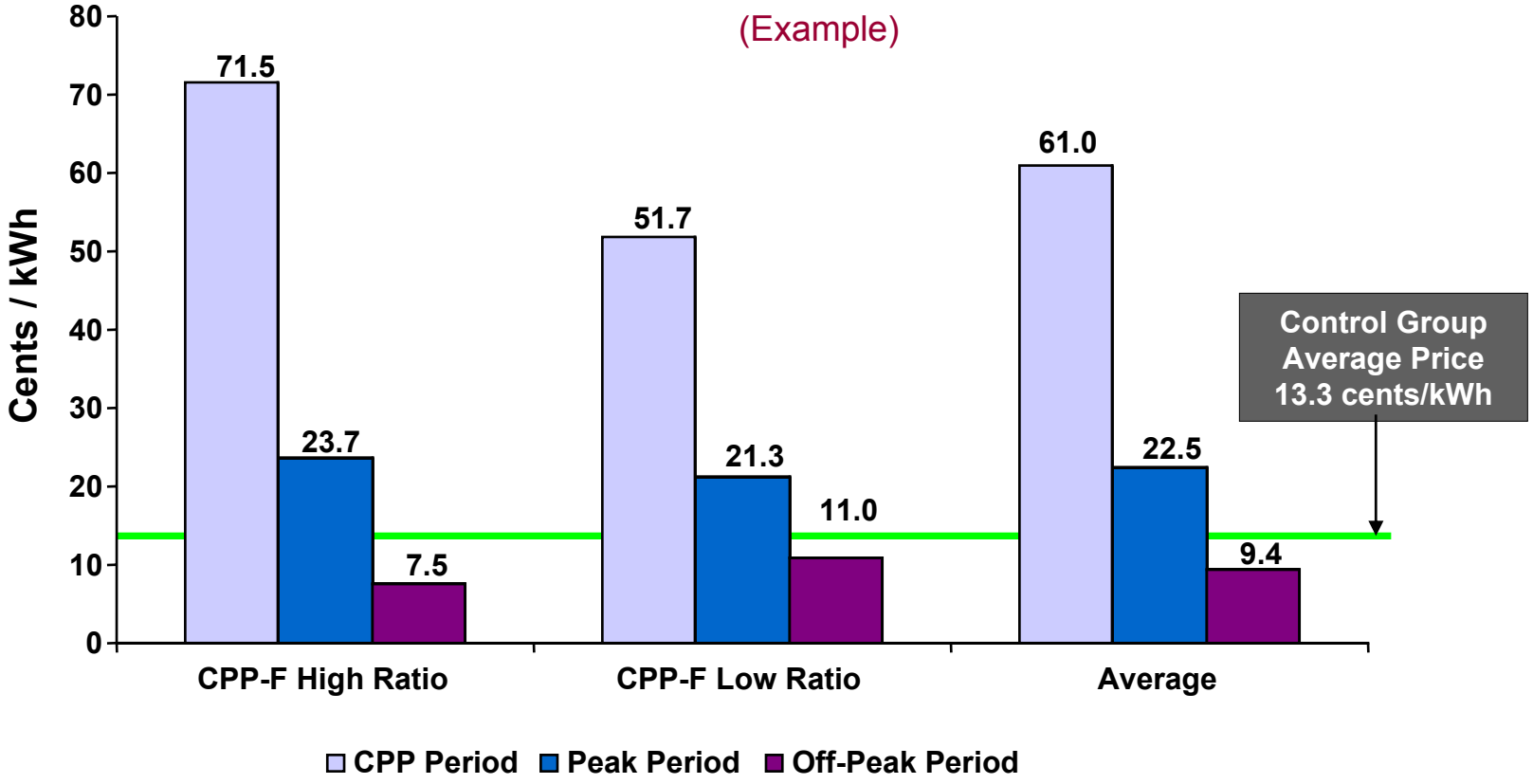


RATE DESIGN

RESIDENTIAL

Residential CPP-F Rate

(Example)



Source: SPP Summer 2003 Update Analysis, Charles Rivers Associates, June 9, 2004.

Commercial / Industrial

Small and Medium Commercial Rate Forms

SPP TOU & CPP High Options

Average Prices For C&I Customers During Treatment Period ($/kWh)						
Customer Segment	Rate Treatment	Price Ratio	Non-CPP Day		CPP-Day	
			Peak Period	Off-Peak Period	Peak Period	Off-Peak Period
Less Than 20 kW	Avg. Inverted Tier	n/a	Average Tier 0.186		Average Tier 0.186	
	TOU	High	**0.272**	**0.094**	**0.272**	**0.094**
		Low	0.325	0.159	0.325	0.159
	CPP-V	High	**0.200**	**0.095**	**1.070**	**0.091**
		Low	0.256	0.169	0.813	0.166
Greater Than 20 kW	Avg. Inverted Tier	n/a	Average Tier 0.154		Average Tier 0.154	
	TOU	High	**0.224**	**0.100**	**0.224**	**0.100**
		Low	0.254	0.144	0.254	0.144
	CPP-V	High	**0.187**	**0.086**	**0.820**	**0.084**
		Low	0.212	0.137	0.629	0.136

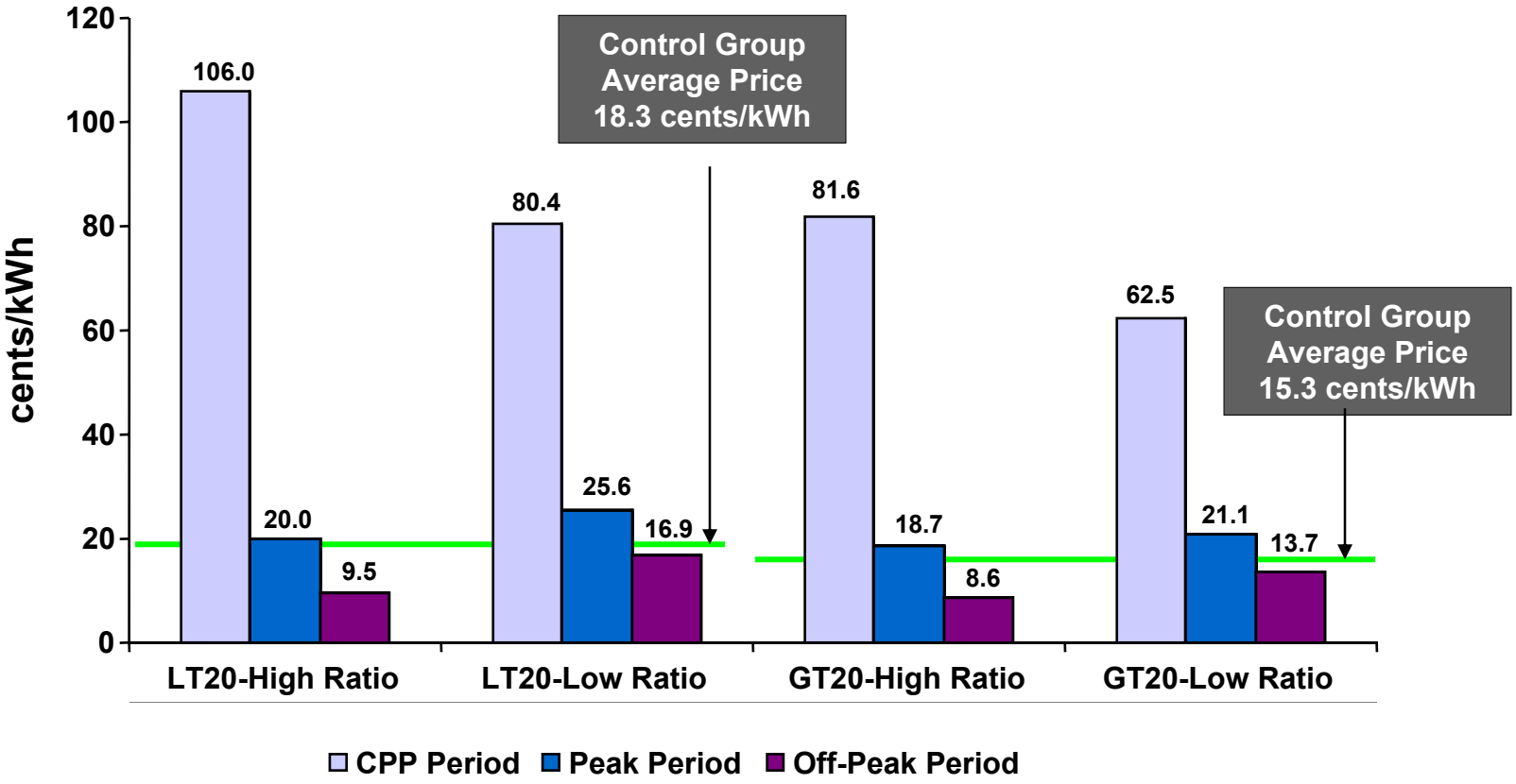
Source: SPP Summer 2003 Update Analysis, Charles Rivers Associates, June 9, 2004.

RATE DESIGN

Commercial / Industrial

Small and Medium Commercial CPP-V Rate

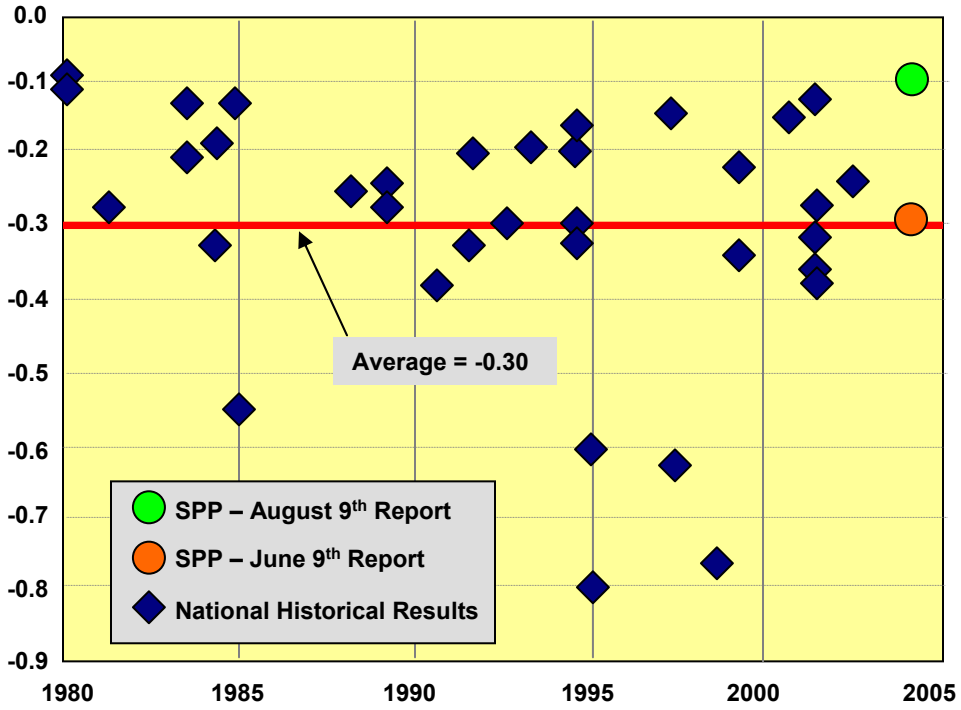
(Example)



Source: SPP Summer 2003 Update Analysis, Charles Rivers Associates, June 9, 2004.

System-wide Impacts

Own-Price Peak Elasticities
California SPP vs. Nationwide Historical Results



HISTORICAL RESULTS

Predicting California Demand Response, Chris King and Sanjoy Chatterjee, Public Utilities Fortnightly, July 1, 2003, p.27-32.

PILOT RESULTS

Residential CPP-V, Statewide Pricing Pilot, Summer 2003 Impact Analysis, Charles Rivers Associates, August 9, 2004, pg.12.

Residential CPP-F, Statewide Pricing Pilot, Summer 2003 Impact Analysis, Charles Rivers Associates, August 9, 2004, Table 5-3..

Short-Run versus Long-Run Elasticity Measures

Historical Studies
Own-Price Elasticity Results

Climate Zone	Short-Run Elasticity[1]	Long-Run Elasticity[2]	Ratio Long/Short
Low	-0.12	-0.60	5.0 : 1
Medium	-0.20	-0.90	4.5 : 1
High	-0.35	-1.20	3.5 : 1

1. Short-run – customers make no change in appliance holdings.
2. Long-run – customers change appliance holdings and invest in more efficient operating practices.

Source: Predicting California Demand Response, Chris King and Sanjoy Chatterjee, Public Utilities Fortnightly, July 1, 2003, p.27-32.

Residential Load Impacts

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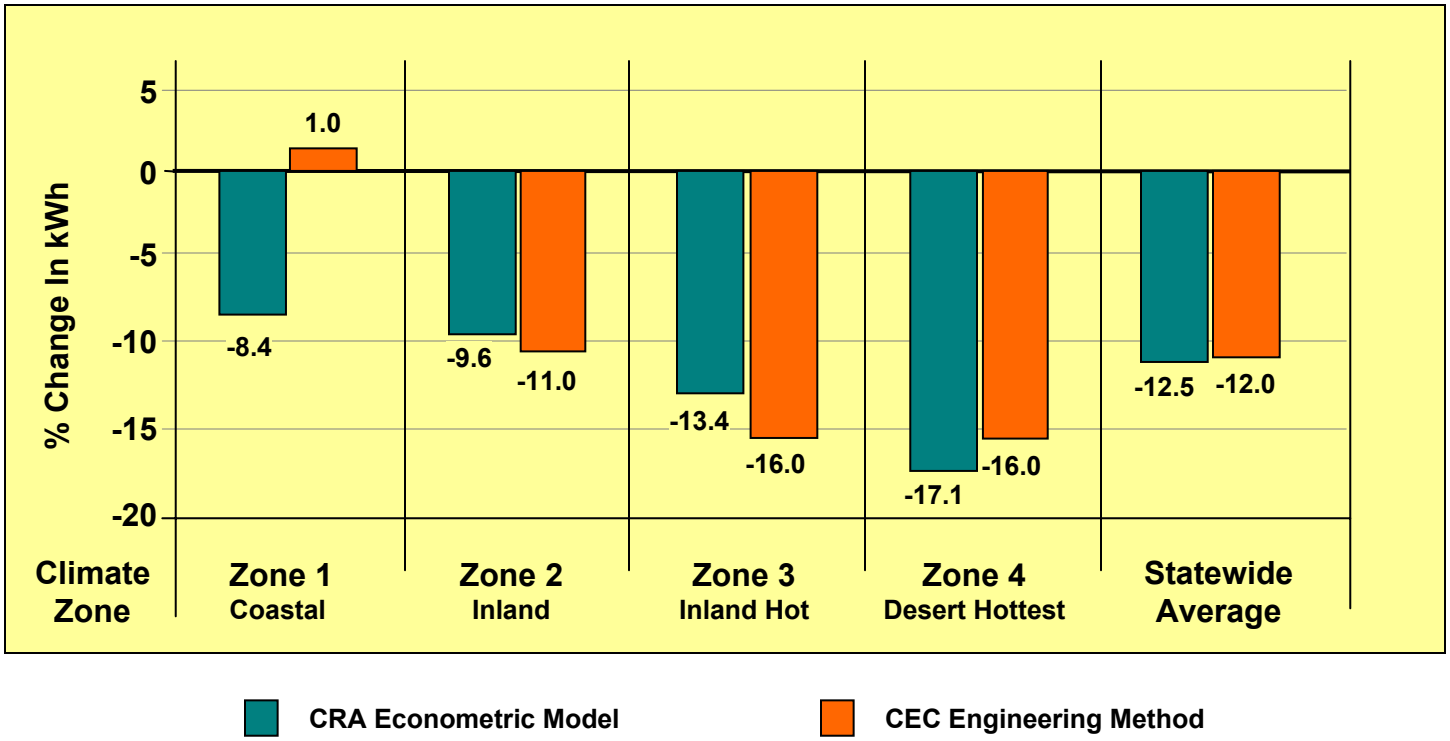
Percent Change In Peak Period Energy Use

CPP-F Customers on Critical Peak Days By Weather Zone



Source: Statewide Pricing Pilot, Summer 2003 Impact Analysis, Charles Rivers Associates, August 9, 2004, Table 5-4

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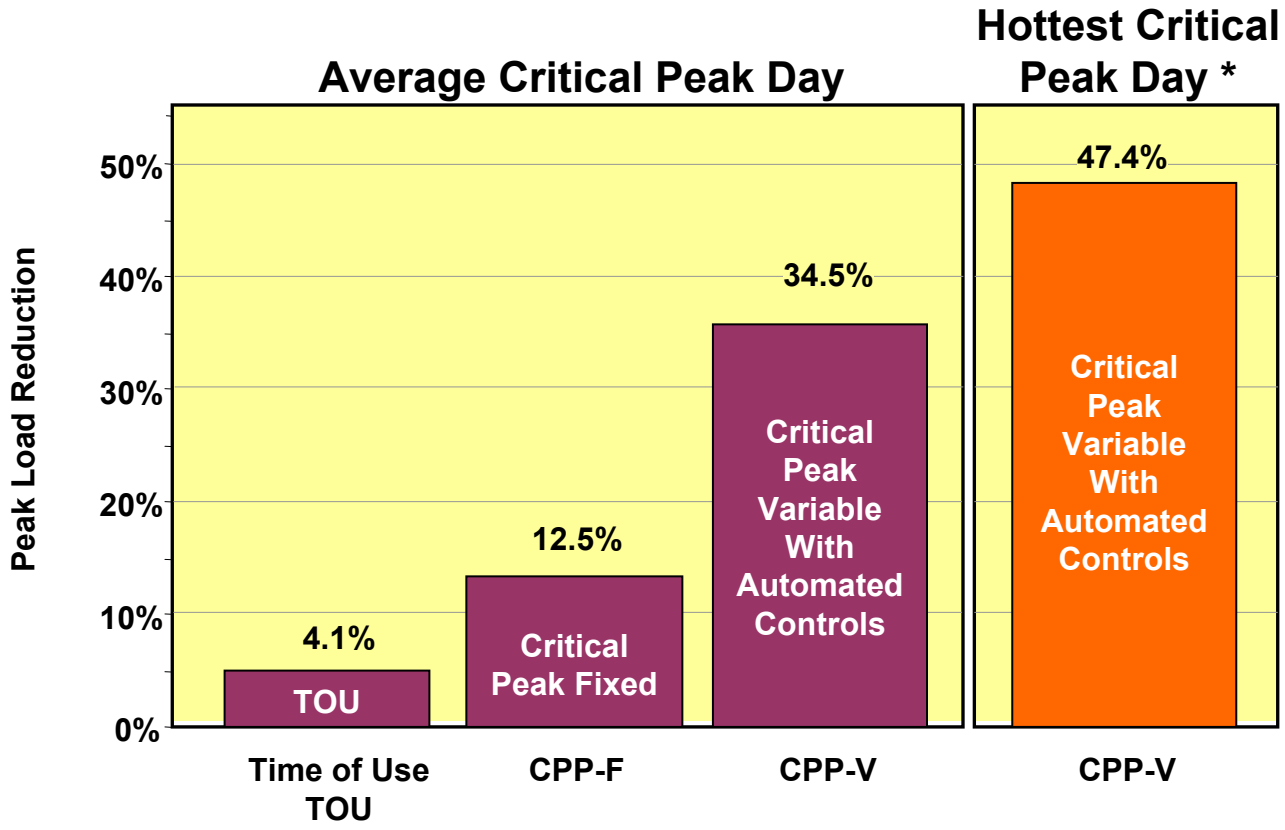
Actual Residential Critical Peak Impacts By Rate Treatment



Source: Statewide Pricing Pilot Summer 2003 Impact Analysis, Charles Rivers Associates, Table 1-3, 1-4, August 9, 2004.

* Hottest day impacts discussed on page 105.

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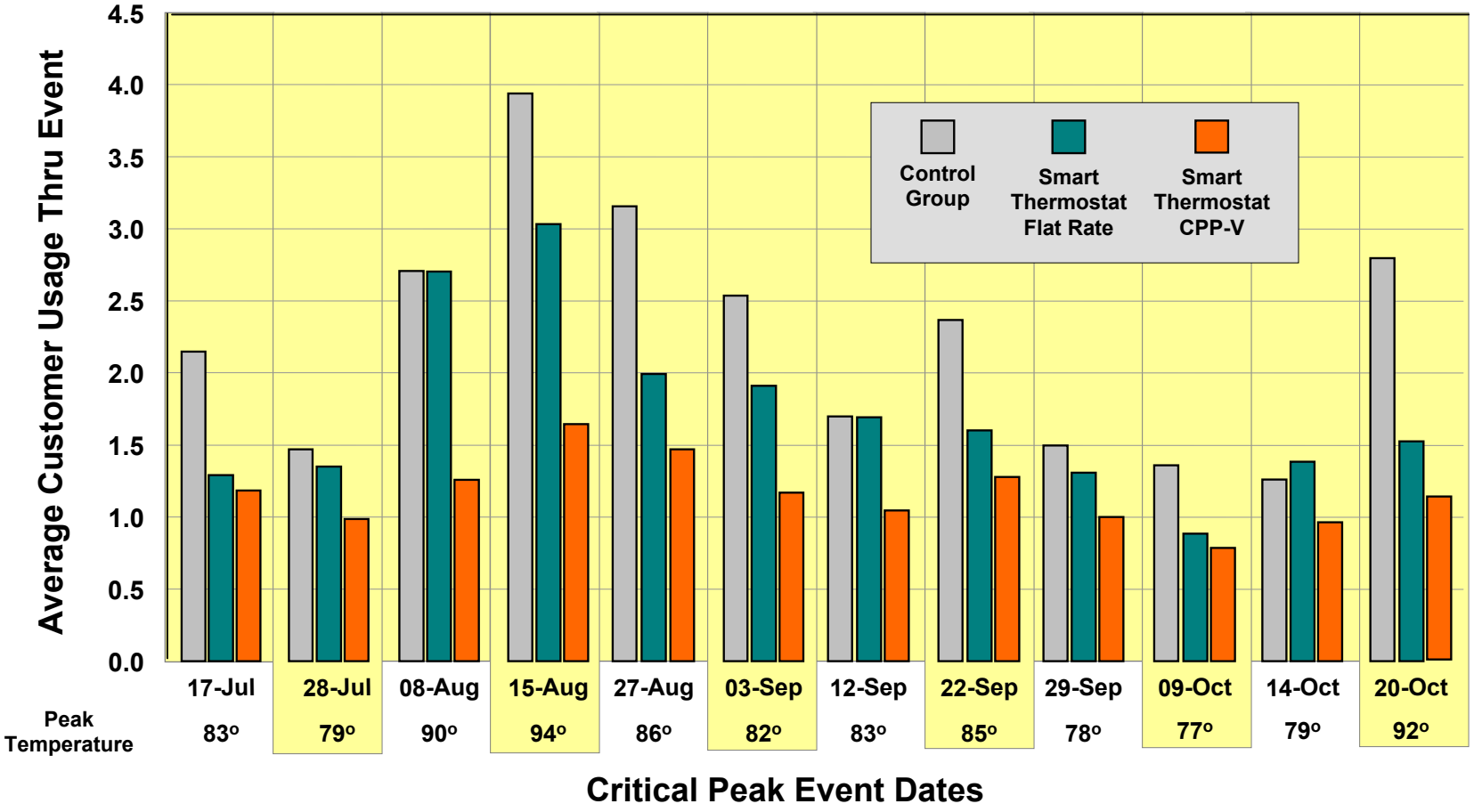
Actual Residential Critical Peak Impacts

Control Group, AB970 Smart Thermostat and CPP-V Treatments

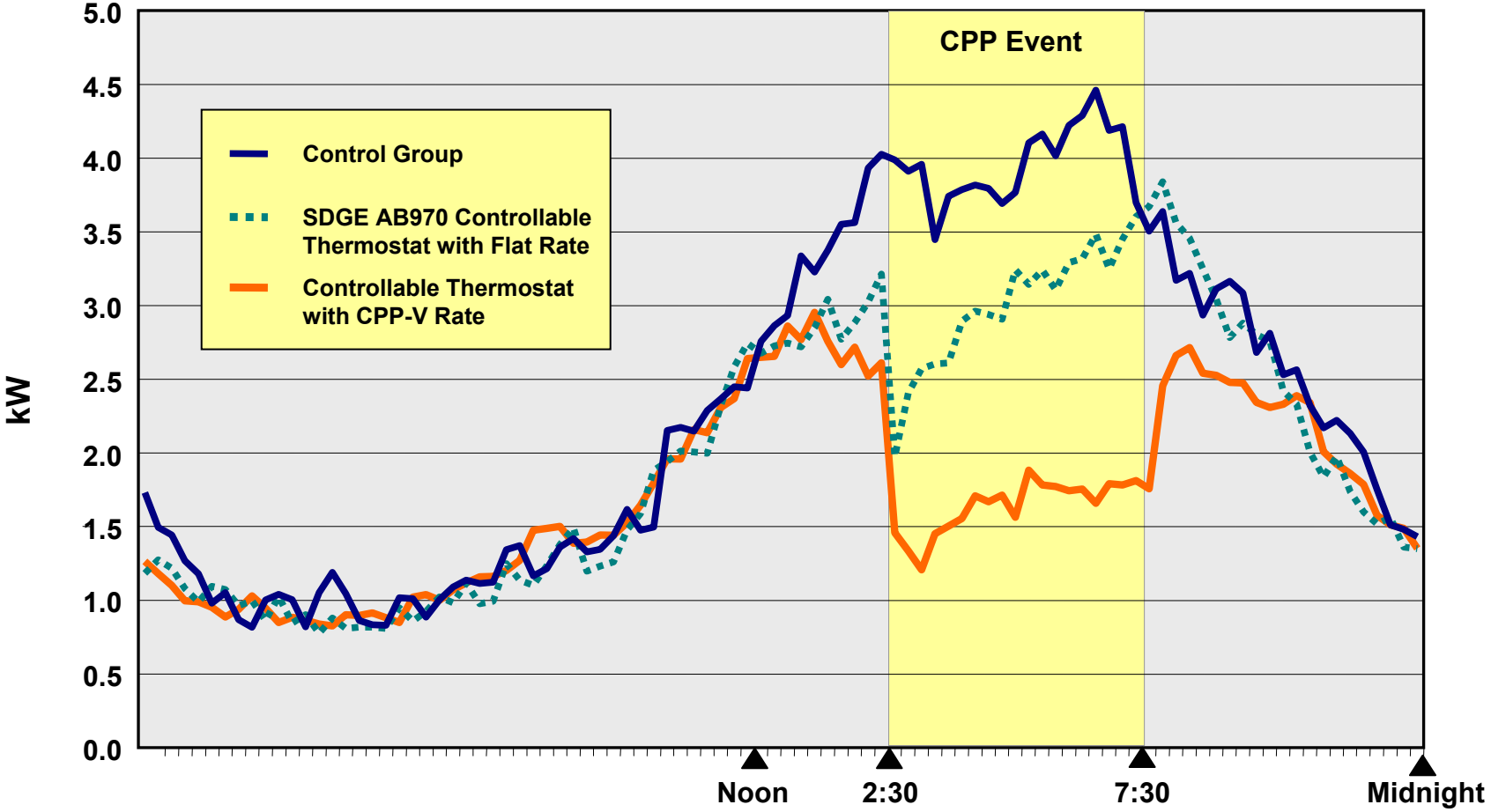


Source: Response of Residential Customers to Critical Peak Pricing and Time-of-Use Rates during the Summer of 2003, September 13, 2004, CEC Report.

RESIDENTIAL

Example Residential Customer CPP-V Response

(Hot Day, August 15, 2003, Average Peak Temperature 88.5^0)



Source: Response of Residential Customers to Critical Peak Pricing and Time-of-Use Rates during the Summer of 2003, September 13, 2004, CEC Report.

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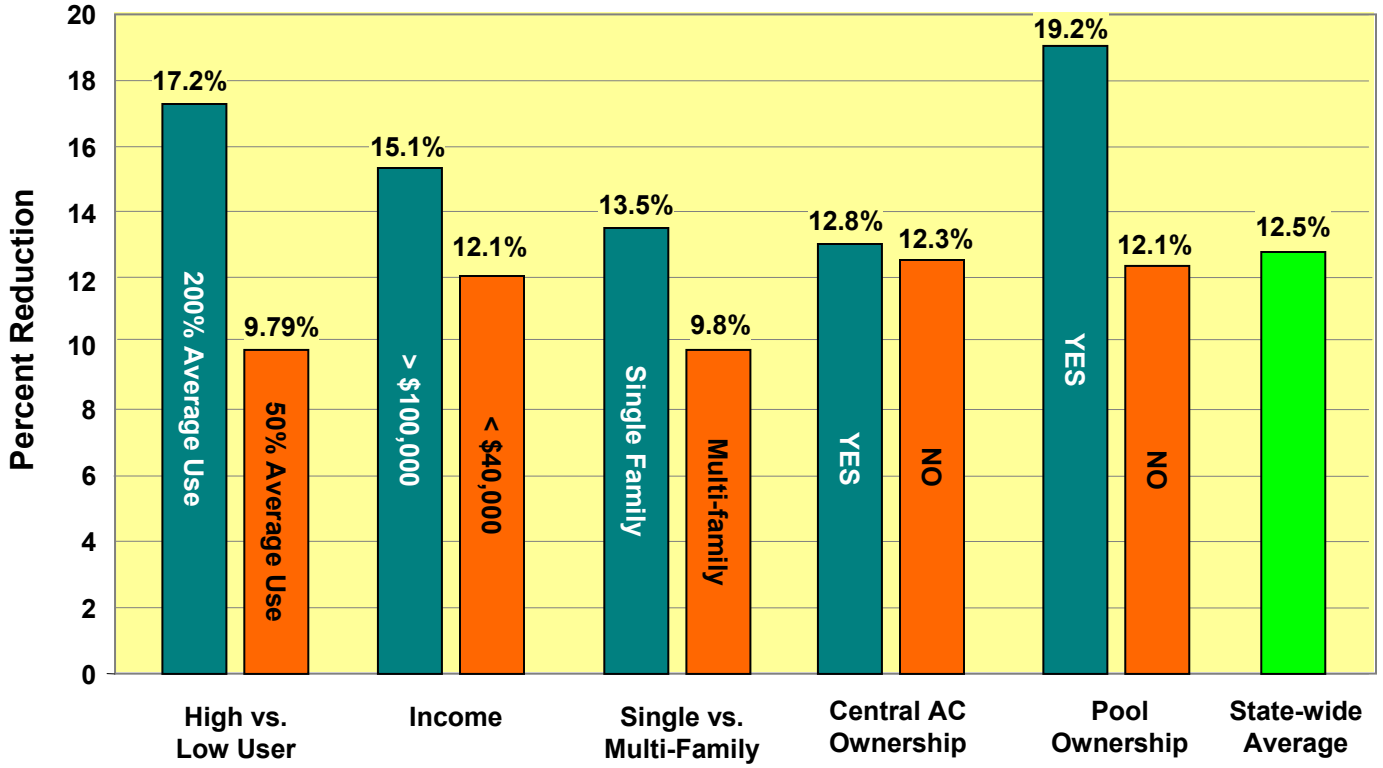
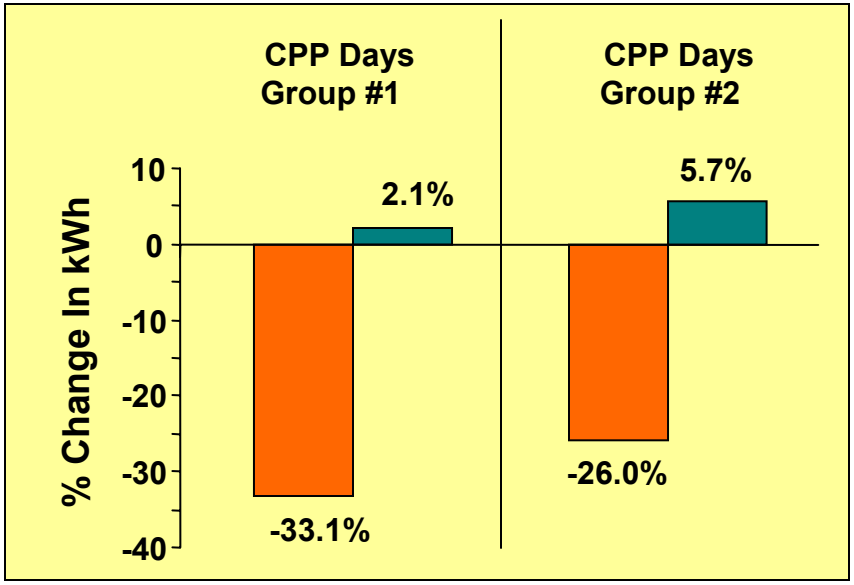
Residential CPP Response by Attribute
Percent Reduction in Peak Period Usage



Source: Statewide Pricing Pilot, Summer 2003 Impact Analysis, CRA, August 9, 2004, Table 5-9, p.90

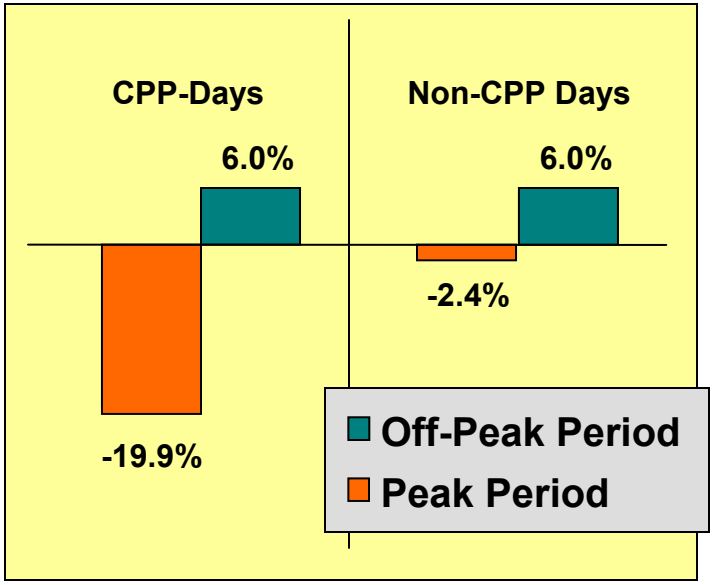
Small and Medium Commercial Load Impacts

Small Commercial <20kW Customers
CPP-V Rate Impacts
Percent Change In Energy Use By Rate Period



Model Output June 9, 2004

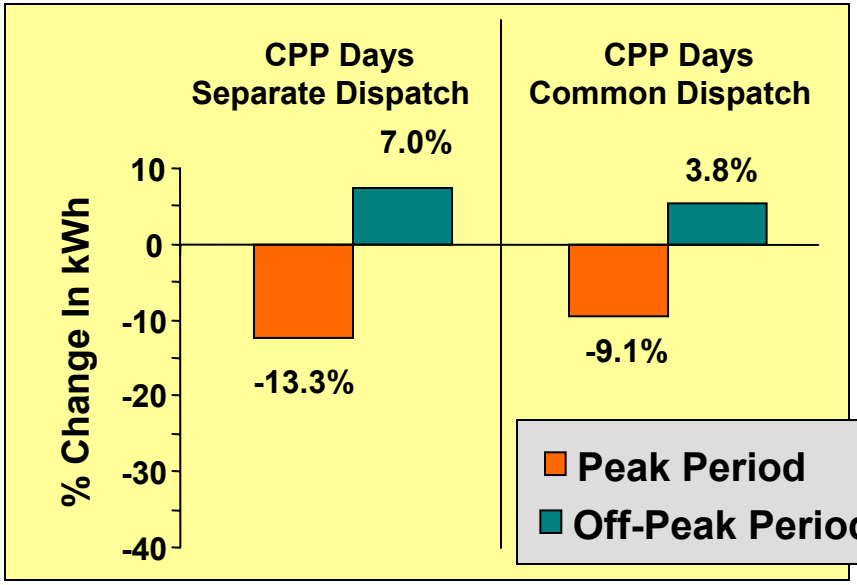
Source: SPP Summer 2003 Update Analysis, Charles Rivers Associates, June 9, 2004.



Model Output August 9, 2004

Source: Statewide Pricing Pilot Summer 2003 Impact Analysis, Charles River Associates, Table 6-4, August 9, 2004.

Small Commercial >20kW Customers
CPP-V Rate Impacts
Percent Change In Energy Use By Rate Period



Model Output June 9, 2004

Source: SPP Summer 2003 Update Analysis, Charles Rivers Associates, June 9, 2004.

Analysis inconclusive.

Model Output August 9, 2004

Source: Statewide Pricing Pilot Summer 2003 Impact Analysis, Charles Rivers Associates, p111, August 9, 2004.

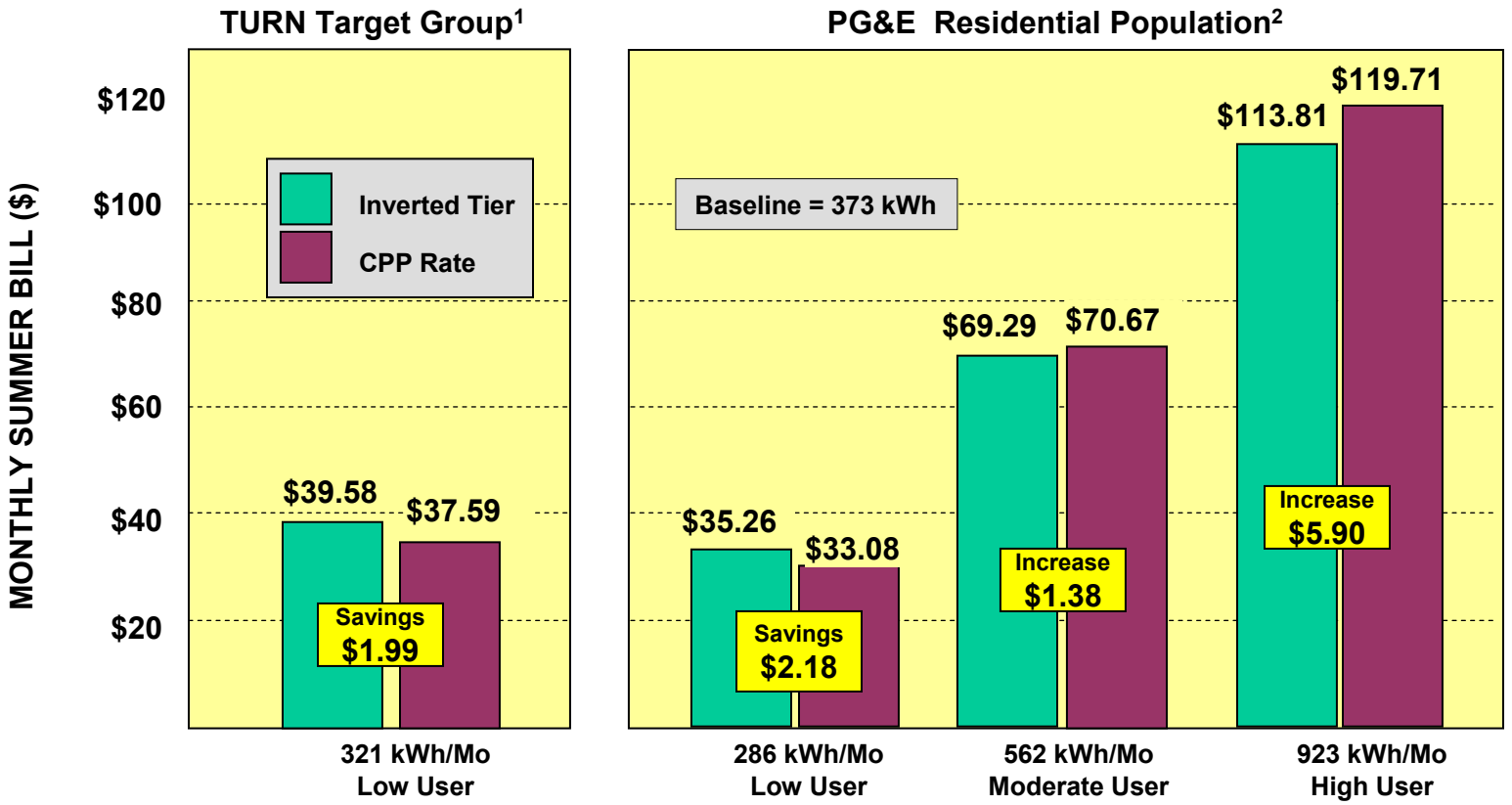
Customer Bill Impacts

RESIDENTIAL

Estimated Expected Residential Bill Impacts

Inverted Tier vs. SPP CPP-V Rate

(Summer, Assumes no customer response, no additional meter charge)



1. Target Population identified: Financial Externalities and "Peak Hogs": New Consideration for Energy Efficiency and Rate Design Policy, by William B. Marcus, Principle Economist, JBS Energy, Inc., March 2001.

2. Target Population identified from PG&E SPP rate design exercise.

Actual SPP Participant Bill Impacts

(summer / winter 2003)

		Residential			Small-Medium Commercial	
		CPPV	CPPF	TOU	CPPV	TOU
Customers With Bill Savings	Participants (%)	71.1%	73.7%	70.0%	80.3%	58.2%
	Average Monthly Savings (%)	5.1%	5.5%	4.5%	12.2%	9.6%
	Average Monthly Savings ($)	$6.81	$3.89	$3.25	$155.17	$90.65
Customers With Bill Increases	Participants (%)	28.9%	26.3%	30.0%	19.7%	41.8%
	Average Monthly Increase (%)	4.0%	6.2%	3.0%	5.0%	10.0%
	Average Monthly Increase ($)	$5.03	$4.93	$3.32	$22.89	$62.52

Source: Statewide Pricing Pilot, Shadow Bill Results, WG3 report, June 9, 2004.

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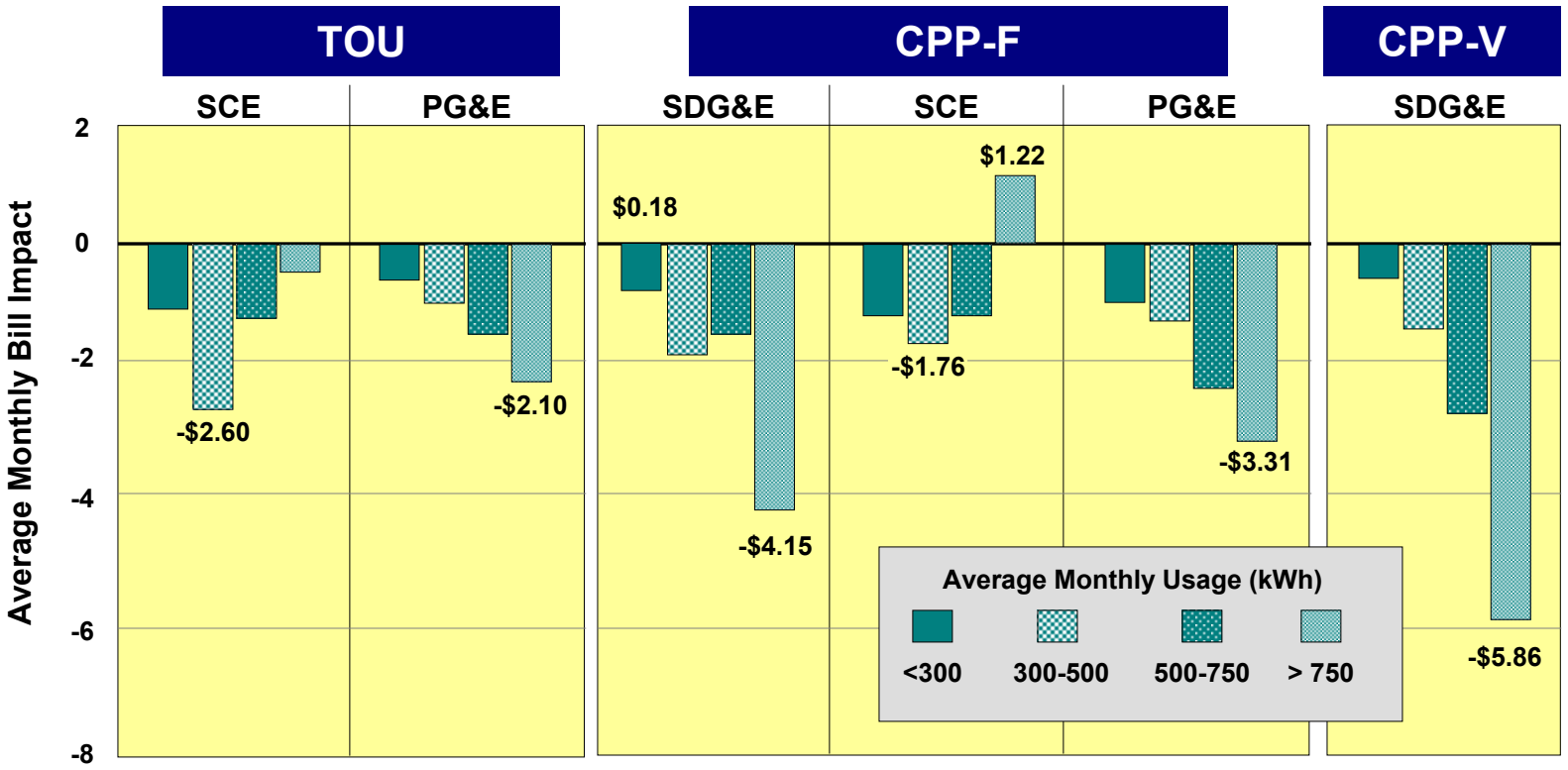
Actual Residential Bill Impacts by Rate

Change in Average Monthly Customer Bill, July 2003 thru May 2004



Source: Response of Residential Customers to Critical Peak Pricing and Time-of-Use Rates during the Summer of 2003, September 13, 2004, CEC Analysis.

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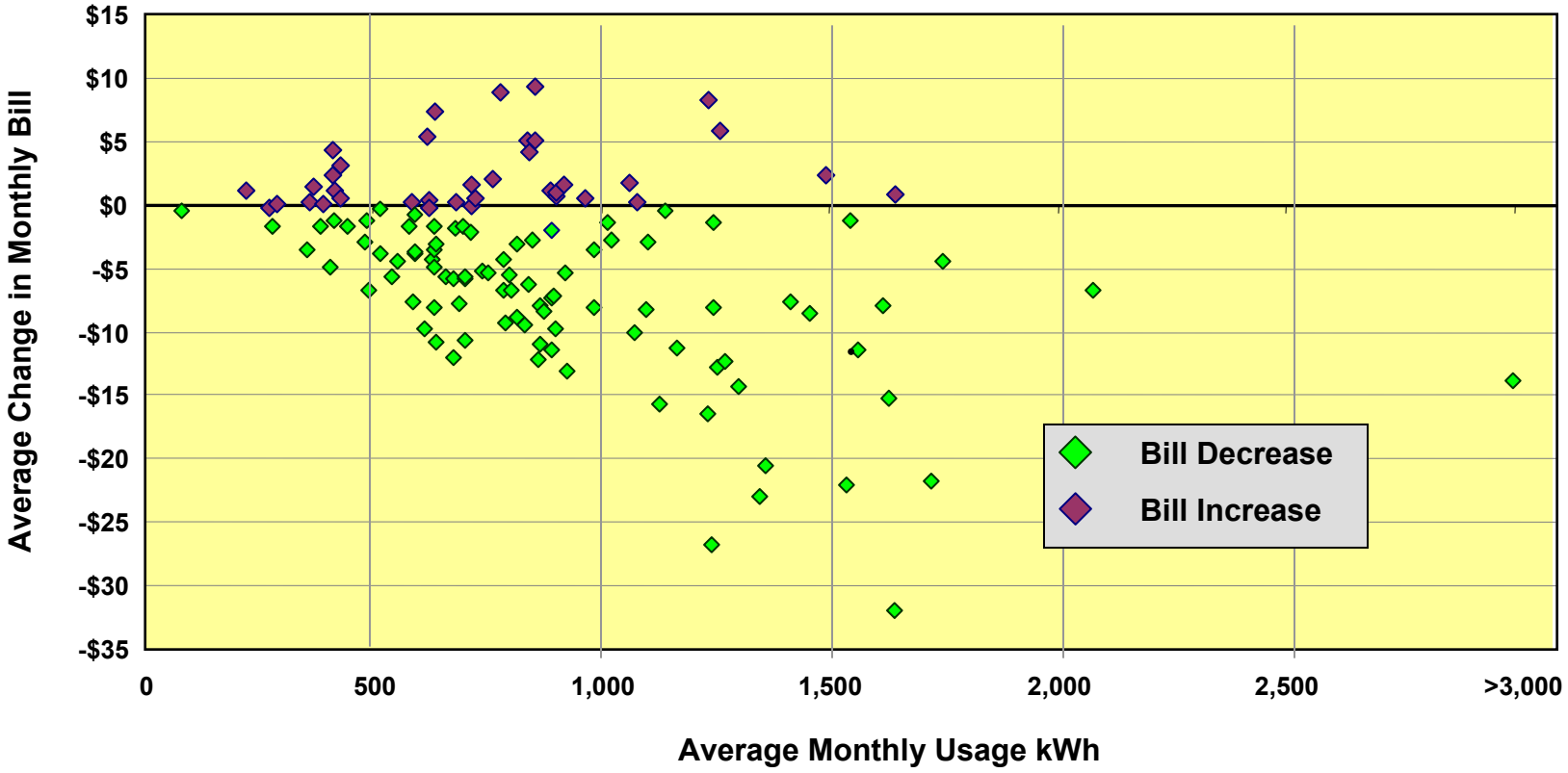
Actual Distribution of Residential Bill Impacts

(SDGE CPP-V Example, July 2003 thru May 2004)



Source: CEC analysis of SPP billing data, August 2004 (SDG&E).

Customer Acceptance

Existing Inverted Tier Rates
Customer Understanding

1. **Customers don't understand how electricity use is measured.**
2. **Customers don't understand how electricity is priced.**
3. **There is an uncertain and inaccurate link between how customers use energy, what they pay and what they get in service value.**
4. **Bill accuracy – customer's must trust their supplier. No other choice.**

Sources: Residential Customer Understanding of Electricity Usage and Billing, Momentum Market Intelligence, WG3 Report, January 29, 2004.pviii-ix.

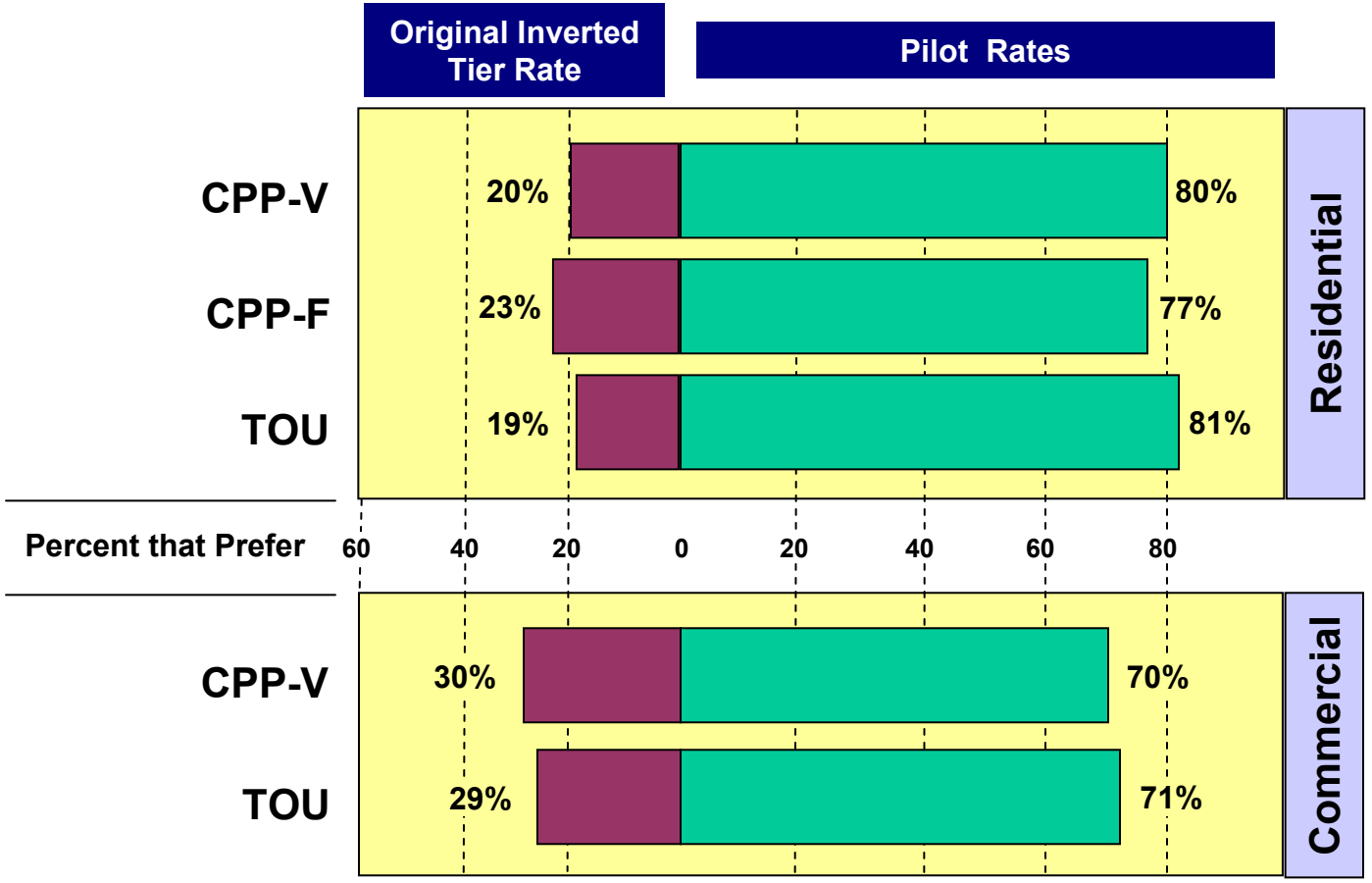
Dynamic Rates
Customer Understanding

1. **"..most respondents could easily understand the logic of time-differentiated electricity prices,.."**

2. **"..customers understood time-differentiated pricing (at least the on-peak / off-peak variety) more easily than they understood the notion of inclining block [tiered] or declining block pricing."**

Source: Residential Customer Understanding of Electricity Usage and Billing, Momentum Market Intelligence, WG3 Report, January 29, 2004.p16.

SPP Customer Rate Preference



Source: SPP End-of-Summer Survey Report, Momentum Market Intelligence, WG3 Report, January 21, 2004, p23-24.

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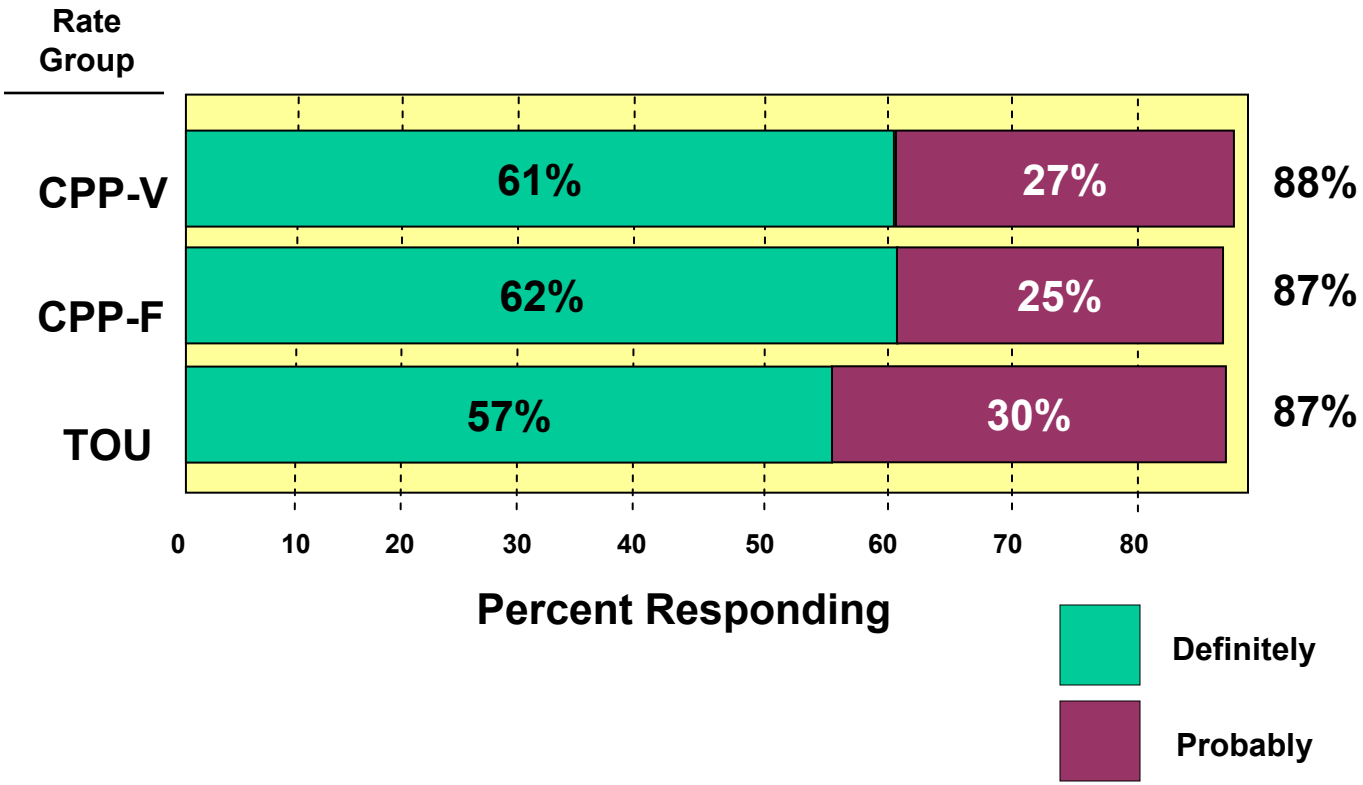
Rates Should be Offered to All Residential Customers



Source: SPP End-of-Summer Survey Report, Momentum Market Intelligence, WG3 Report, January 21, 2004